

**AMENDMENTS TO CLAIMS**

**Claims 1-21 (cancelled).**

**Claim 22 (new) A rock and ore crusher apparatus having a suspended impeller, the crusher apparatus comprising:**

- a) a supporting main frame structure,
- b) a substantially hollow impeller support spindle having opposite  
5 terminal ends, the interior confines of the hollow spindle open through said opposite terminal ends,
- c) a support bearing apparatus on said main frame arranged to supportingly engage said spindle for rotation of the spindle in substantially vertically-suspended condition supported on said main frame, the opposite terminal  
10 ends of the spindle identifying respective vertical top and bottom ends of the vertically-suspended spindle supported rotatably on the main frame,
- d) power drive means on said main frame for engaging said spindle to rotate the spindle supported in vertically-suspended condition on the main frame by said support bearing apparatus,
- 15 e) a rock and ore impeller mounted on the vertical bottom end of the suspended spindle for rotation therewith, the interior confines of the hollow spindle open to the impeller through the bottom end of the spindle,

f) a hopper supported on the main frame and arranged to receive rock and ore material to be crushed, said hopper further arranged to communicate rock and ore material from the hopper into the hollow interior confines of the vertically-suspended, rotatable spindle through the vertical open top end thereof, for passage of rock and ore material through the hollow spindle to said impeller during powered rotation of the spindle and impeller mounted thereon,

g) an annular rock impact chamber supported on said main frame structure and arranged to freely encircle said impeller, said annular chamber arranged to receive rock and ore material ejected from the rotating impeller in material-shattering impact within the encircling annular chamber, and

h) crushed material discharge means for communicating with said annular chamber and receiving crushed material falling from the annular chamber after impact therein and for discharging the material from the crusher apparatus,

i) whereby with the power drive means operating to rotate said spindle and impeller at a selected speed of rotation, rock and ore material to be crushed may fall from the hopper vertically through the interior of the vertically suspended, rotating, hollow spindle to the rotating impeller whereupon the material is ejected outwardly from the impeller and into violent, crushing impact within the impeller-encircling annular chamber, the impacted material then falling by gravity from the

annular chamber for discharge from the crusher apparatus.

Claim 23 (new) The crusher apparatus of claim 22 wherein said main frame structure supports a vertically movable elevator frame and said annular chamber is supported on said vertically movable elevator frame, and power drive means interengages said main frame and elevator frame for selectively moving the elevator  
5 frame and supported annular chamber vertically on the main frame between a first, operative position in which the annular chamber is positioned to encircle said impeller for operation of the crusher apparatus, and a second, vertically-displaced, maintenance position in which the annular chamber is positioned out of impeller-encircling condition for inspection, servicing and replacement of the impeller.

Claim 24 (new) The crusher apparatus of claim 23 wherein said impeller and bottom end of said spindle respectively mount a one of first and second corresponding interengaging connector members of a quick attach and release lock connector apparatus, the connector apparatus arranged for selected relative  
5 movement of said first and second connector members into and out of interengagement with one another for mounting connection and separation, respectively, of the impeller and the spindle.

Claim 25 (new) The crusher apparatus of claim 23 including a swingable, impeller support boom pivotally supported on the main frame for pivotal movement

on the main frame, when the annular chamber is disposed in said second, maintenance position, into a position beneath said impeller and operable to engage  
5 and support the weight of the impeller and pivotally carry a supported impeller out of the confines of the crusher apparatus for facilitated servicing and replacement of impellers.

Claim 26 (new) The crusher apparatus of claim 22 including a substantially hollow rock and ore material-confining static tube, open through its opposite terminal ends, supported on the main frame for substantially free extension through the hollow interior confines of the rotatable spindle, one open end of said tube  
5 communicating with said hopper and the opposite open end of said tube communicating with said impeller for passage of rock and ore material from the hopper to the impeller member through the hollow confines of the static tube.

Claim 27 (new) The crusher apparatus of claim 22 wherein said support bearing apparatus comprises a single anti-friction bearing assembly contained with an annular enclosure supported on the main frame by interengaging, flexible mount apparatus arranged to absorb vibration and wobbling of the rotating spindle during  
5 rock and ore crushing operation of the crusher apparatus.

Claim 28 (new) The crusher apparatus of claim 22 wherein said power drive means includes a pair of drive motors supported on said main frame in substantially

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opposing position one to the other with the vertically-suspended spindle disposed therebetween, each said drive motor drivingly engaging a spindle-engaging drive  
5 belt arranged to rotate the spindle upon operation of said drive motors, and belt tensioning means for tensioning each said drive belt during operation of the crusher apparatus.